

## LARVÆ OF A SATURNIID MOTH USED AS FOOD BY CALIFORNIA INDIANS.<sup>1</sup>

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(WITH PLATE I.)

In July, 1911, when I spent a few days at Mono Lake, California, investigating the insects of the lake especially, I was told of a "worm" used as food by the Pai-Ute Indians of the vicinity. No opportunity for getting material came until the morning of my departure. While I was at the Mono Lake post-office awaiting the departure of my stage, the postmaster, Mr. John Mattley, an old Swiss pioneer of the basin who had taken a very intelligent interest in my work, asked me, "Have you seen the worms the Indians eat?" I replied that I had not, but very much wished to do so. Up to this time my information had led me to suppose the insects were larvæ of borers in the trunks of trees. He had two Indian women working in his hay-field, both of them at the time standing about in the road by the residence. "Come with me," he exclaimed, and approached one of the women, asking her the question, "Have you got any of those worms on hand?" The woman grinned rather sheepishly, as if expecting the subject to be a matter of ridicule, and said, "No, all gone." "But you had a lot yesterday," persisted Mr. Mattley. "All gone," was all she would reply, so Mr. Mattley took me along to the other woman. She began with the same reply, but finally admitted that there were some of the cooked ones still on hand. "Show them to us," demanded Mr. Mattley, and she led us to her camp near by, where she laid back an old cloth and disclosed a much-smoked three-quart tin bucket, nearly full of a yellowish, greasy-looking stew. Considerably excited by the prospect, I picked up a little stick and began to fish in the stew. It was half full of large caterpillars, blackened by drying, resembling dried and stewed prunes as much as anything. One of them I pulled in two and thrust a half in my mouth to see what sort of food it was. I found it tough and almost flavorless,

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with an insipidity beyond expectation on account of the absence of salt in the stew. The fat had cooked out so as to float on the fluid, and had a strong odor like linseed oil, which was in fact the only quality beyond toughness that I noticed. After I had performed the *experimentum crucis*, my hostess, if I may use the term, appeared to be relieved of the fear of ridicule, and brought out a cloth in which she had about a quart of the dried worms, uncooked. These I bought of her and brought home with me. As the stage departed about this time, I secured no farther information from her about the mode of preparing this food material. The description given me by Mr. Mattley and also by Mr. Rector of the general store near by, was to this effect: The caterpillars feed on the leaves of the yellow pine (*Pinus ponderosa*) but not on the one-leaved piñon (*Pinus monophylla*) which is much more abundant about Mono Lake. The Indians collect the caterpillars by making a smudge under the tree, for which purpose they make a trench rather close about the base of the tree; this is presumably to guard against the spread of the fire. As the thick smoke rises and envelopes the caterpillars, it causes them to let go and drop to the ground, where they are collected by the Indians, killed and dried. The preserved material is called Papaia.

A few days later, while I was at Berkeley, Cal., I had a conversation on this subject with Mr. Roy Headley, of the Forest Service in the San Francisco office. He informed me that while inspecting a national forest some distance southeast of the Mono Lake basin, he found every pine over a considerable hillside surrounded by a trench in which there had been a fire; he examined the work with interest, for fear that the forest was being subjected to an undesirable fire risk. It appeared from his statement and what I learned at Mono Lake that the collection of this caterpillar for food is an industry of considerable importance in the territory along the Nevada-California line.

Observing that the stewed specimens, of which I had fortunately saved a couple, were much fresher in appearance than the dry ones, I tried to freshen up some more material by prolonged soaking in warm water. To a certain degree it improved the condition of the specimens, but was far from making them life-like. I then tried injecting the softened specimens with gelatine, which helped a little more. The skins had too many holes in them, after manipulating them to make

them soft, to hold the gelatine very well, so I tried injecting with dental plaster of Paris, and with this I obtained some specimens that were as plump as life, if not more so, and certainly a good deal solidier. Some of these injected specimens, as well as of the shriveled dried ones, are illustrated in the accompanying half-tones.

The identity of the insect concerned remains to be considered. I was surprised to learn that no species is known to have the habits I have described. Material sent to the Bureau of Entomology elicited the following statement from Dr. Howard: "Dr. Dyar has examined the caterpillars eaten by the Indians at Mono Lake, and decided that they are Saturnians, probably of the genus *Hemilcuca*, but he does not know any species feeding on pine or one so common as this must be. He suggests that perhaps it is some 'rare' species whose habits are unknown."

I append a description of a moderately distended injected larva.

Length, 70 mm. Head acorn-colored, 6.3 mm. wide, 5.7 mm. high. Width of widest body-segment (2d abdominal) 11.1 mm. Color as revived yellow mottled with paler and blackish; all the body-segments except the first and the last two crossed by a broad yellow band on its posterior part, which becomes indistinct along the sides about the vicinity of the spiracles. A central dorsal whitish stripe crosses all these bands, and its color interrupts the yellow to some extent, especially along the middle of the length. On each side of the median pale stripe is a wide, blackish stripe, interrupted by the yellow cross-bands; laterad to this is a narrow pale stripe, also interrupted. The side below this is mottled yellow and blackish, with an undulating yellow stripe below the spiracles. Ventral side yellow, prolegs, anal plate and anal prolegs acorn-colored.

The tubercles are all small, black, and so much broken off that I can only make them out by piecing together several specimens. They appear to have the following arrangement: four dorsal in a transverse series across the middle of each segment, for ten body-segments; the eleventh segment with a larger median branched tubercle (shown in profile in half-tone), and only one lateral each side; the twelfth segment with a similar median tubercle arising near the hind edge, and two pairs of lateral ones. Below the line of spiracles there appear to be two small tubercles on each segment, but they become very small and indistinct on the last three segments.

